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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/764,132 | 01/22/2004 | Ulhas Kanhaiyalal Kharul | 3082-6292US | 6101 |
| 24247 | 7590 | 04/06/2006 | | |
| TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110 | | | EXAMINER MENON, KRISHNAN S | |
| | | | ART UNIT 1723 | PAPER NUMBER |

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 10/764,132 | Applicant(s) KHARUL ET AL. | |
| | Examiner Krishnan S. Menon | Art Unit 1723 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-39 are pending as originally filed

Information Disclosure Statement

The specification includes a large number of references. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 3-, - are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 USC 103(a) as being obvious over Sluma et al (US 5,290,448)

Sluma teaches a polymeric porous hollow fiber ultrafiltration membrane comprising two additives (polyacrylonitrile membrane having methacrylate and sodium methallylsulfonate: see examples, abstract, column 2 lines 59-64, and column 3 lines 9-

57). The water permeability and albumin rejection are in the range as claimed (albumin screen coefficient is 0.00, which gives the rejection as 100%).

With respect to the solvent and the additives such as inorganic salts, organic acids and viscosity enhancing agents, these are ingredients in the mix used for making the membrane and are not expected to be retained in the membrane to form a structural part of the membrane. The recited process steps in the product claims are also not patentable. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re *Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The reference teaches methacrylate and sodium methallylsulfonate as 'organic acid/salt' ingredients, but this also is not a patentable limitation, unless applicant can show that the organic acid or its salt forms part of the structure in the membrane.

2. Claims 1-13, 15 and 16 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Christen et al (US 3,930,105).

Christen teaches a hollow fiber ultrafiltration membrane from polyacrylonitrile (abstract) with additives such as styrene sulfonic acid, etc (column 3 lines 27-33), having thickness in the range claimed (column 3 lines 45-50), water flux and albumin

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rejection as claimed (table 1). The additives such as organic acids, inorganic salts, viscosity agents, solvents, non-solvents, process conditions, and process steps claims in the product claims are not patentable limitations. In re Thorpe, see above.

3. Claims 1, 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Linder et al (US 5,039,421).

Linder teaches a polyacrylonitrile membrane with two or more additives coated as flat sheet over a porous backing or as hollow fiber, as claimed – see abstract and column 3 lines 15-67.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christen as applied to claim 1 above, and further in view of Linder et al (US 5,039,421).

Claim 14 differs from the teaching of Christen in reciting the flat-sheet membrane cast on a porous backing. However, making the membrane flat sheet is only an equivalent alternative to making hollow-fibers, and is well known to one of ordinary skill in the art. Linder teaches that membranes can be made into flat sheets or hollow fibers, supported or unsupported – see column 3 lines 15-28. It would be obvious to one of

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ordinary skill in the art at the time of invention to have flat sheet or hollow fiber membrane depending on the application.

5. Claims 17-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christen as applied to claim 1 above, and further in view of Brooks et al (US 4,364,759).

Christen teaches a process for making a hollow fiber membrane by having the polyacrylonitrile dissolved in a solvent such as DMF with added ingredients such as styrene sulfonic acid, etc., with a minor amount of non-solvent, spinning the hollow fibers, and coagulating in a coagulation bath, followed by washing, etc. to make the membrane. Temperature is in the range as claimed. Composition of the polymers and organic acids – see examples. See column 4 lines 13-30 and 48-65.

The instant claims differ from the teaching of Christen in the recitation of the mixing steps in claim 17, and in the % composition of the inorganic salts and non-solvents or viscosity agents in the dope. Such details are obtained from the teaching reference Brooks. Brooks teaches the various steps of mixing, degassing, and filtering, order of addition, slow mixing, % viscosity agents and inorganic salts as claimed: see column 5 lines 6-54, column 6 lines 33 – 67, and column 7 lines 1-65. The mixing step is taught as 'by component by component basis'. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Brooks in the teaching of Christen for the process of making the membrane because Christen does not give the details and Brooks teaches the various reasons/advantages for the steps involved.

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Actual sequence of addition of ingredients is not patentable: *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930) (Selection of any order of mixing ingredients is prima facie obvious.).

Specific time periods for mixing steps, etc are also not patentable because they are optimizable depending on the solubility properties of the materials and the solvents and factors such as temperature. See Brooks column 6 lines 56-65. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch and Slaney*, 205 USPQ 215 (CCPA 1980); *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Krishnan S. Menon
Patent Examiner
4/5/06